

on Christmas Day, 1911. The lowest temperature recorded on the Barrier was -60° C. (-76° F.) on July 6, and this is the lowest temperature recorded anywhere in the Antarctic.

METEOROLOGICAL STATION IN GREENLAND.

In *Nature* for May 26, 1921, it is stated that the Danish Government is to make provision at an early date for the establishment in Greenland of a high-powered radio and meteorological station. This action is in accordance

with a recommendation of the International Commission for Weather Telegraphy which met in London last November. Such a station will be of untold value to weather forecasting in Europe and possibly in Canada and the United States also. At present the gap between American and European meteorological observations is so great that American observations can hardly be used for European forecasting; but the establishment of the Greenland station will serve as a bridge to this gap and enable European meteorologists to make definite and systematic use of American weather observations.—*C. L. M.*

BIBLIOGRAPHY.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Professor in Charge of Library.

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Fabris, Cesare.

Tipi isobarici principali e loro azione sull'Italia. Parte I.— Descrizione dei tipi isobarici e considerazioni sulle cause che ne determinano la struttura. [Ferrara] 1917. 30 p. 34 cm. (R. Servizio aerologico italiano.)

Houk, Ivan E.

Rainfall and run-off in the Miami Valley. Dayton. 1921. 234 p. 23 cm. (Miami conservancy district. Technical reports, part 8.)

Italy. R. Servizio aerologico.

Correzioni ai tiri delle artiglierie relative alla densità dell'aria e al vento. Ferrara. 1918. 15 p. 24 cm.

Korhonen, W. W.

Ilmanpaineolojen vaikutuksesta ilman lämpötilaan keväällä. Helsingfors. 1917. p. 121-132. 25 cm. (Eri painos Suomalaisen tiedeakatemian Esitelmät ja pöytäkirjat.)

Korhonen, W. W.

Kevättulvasta ja kesäkauden sateista maanviljelysoloja silmällä pitäen. Helsingfors. 1918. 36 p. 264 cm. (Maataloushallituksen tiedonantoja, no. 123.)

Korhonen, W. W.

Lumisateesta Suomessa. Helsingfors. 1917. 43 p. 25 cm. (Eri painos Esitelmät ja pöytäkirjat.)

Korhonen, W. W.

[1] Talvisen lumipeitteenvaikutus kevään lämpötilaan ja säätilan pysyväisyys. [2] Sadetuliruusuja Suomessa, 1901-1910. [3] Sadetauluja Suomesta vuosilta 1886-1915. Helsingfors. 1917. p. 137-231. 25 $\frac{1}{2}$ cm. (Eri painos Suomalaisen tiedeakatemian Esitelmät ja pöytäkirjat.)

Peine, William Franz.

Der Gang der Lufttemperatur und des Luftdruckes zu Chemnitz von 1886 bis 1905. Weida i. Th. 1919. 80 p. 23 cm. (Inaug.-Diss. Leipzig.)

Witting, Rolf.

Beobachtungen von Oberflächenstrom, Tiefenstrom und Wind an Feuerschiffen in den Jahren 1900-1910. Helsingfors. 1912. 99 p. 33 cm. (Finnländische hydrogr.-biologische Untersuchungen, no. 9.)

Witting, Rolf.

L'influence de l'état de l'atmosphère sur la surface de la mer. Helsingfors. 1917. 7 p. 23 $\frac{1}{2}$ cm. (Öfversigt af Finska vetenskaps-societetens förhandlingar, bd. 59. 1916/17. Afd. A, no. 13.)

Woodward, Sherman M.

Hydraulics of the Miami flood control project. Dayton. 1921. 343 p. 23 cm. (Miami conservancy district. Technical reports, pt. 7.)

RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.

C. F. TALMAN, Professor in Charge of Library.

The following titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers and other communications bearing on meteorology and cognate branches of science. This is

not a complete index of all the journals from which it has been compiled. It shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau.

- Aeronautical journal.* London. v. 25. May, 1921.
 Dobson, G. Meteorology in the service of aviation. p. 223-236.
 [Abst. in REVIEW, Apr., 1921, 49: 239.]
- Beiträge zur Physik der freien Atmosphäre.* Leipzig. Bd. 9. H. 3. 2. Jan., 1921.
 Defant, A. Ueber die Dynamik der Böen. p. 99-113.
 Ficker, H. Bemerkungen über die Polarfront. p. 130-136.
 Peppler, Albert. Windmessungen auf dem Eilveser Funkenturm. p. 114-129.
- Beiträge zur Physik der freien Atmosphäre.* Leipzig. Bd. 9. H. 4. 15. März, 1921.
 Koschmieder, Harald. Zwei bemerkenswerte Beispiele horizontaler Wolkenschläuche. p. 176-180.
 Schedler, Anton. Die Beziehungen zwischen Druck und Temperatur in der freien Atmosphäre. p. 181-201.
 Wigand, Albert. Methodik aerophysikalischer Flüge. 1. Ein Flugzeug-Meteorograph. p. 137-147.
 Wigand, Albert, & Wienecke, Alfred. Methodik aerophysikalischer Flüge. 2. Die Anbringung von Meteorographen im Flugzeuge. p. 148-162.
- Wigand, Albert, & Wienecke, Alfred. Methodik aerophysikalischer Flüge. 3. Temperatormessungen im Flugzeuge. p. 163-175.
- Discovery.* London. v. 2. Apr., 1921.
 Horner, Donald W. Up-to-date meteorological equipment. no. 2. p. 99-102.
- France. Académie des sciences. Comptes rendus.* Paris. T. 172. 1921.
 Vallot, J. La radiation diffuse au mont Blanc, comparée à celle des altitudes inférieures. p. 1337-1339. (30. mai.)
 Mengel, Octave. Influence du relief et de l'échauffement du sol sur les vents de surface. p. 1432-1434. (6. juin.)
 Schereschewsky, Ph. Sur les systèmes nuageux. p. 1429-1431. (6. juin.)
- Great Britain. Meteorological office. Monthly meteorological charts, East Indian seas.* July, 1921.
 Smith, L. A. Brooke. Weather in Australian waters. With some suggestions as to how navigators may forecast by using W/T weather reports.
- Great Britain. Meteorological office. Professional notes.* no. 15.
 Durward, J. Diurnal variation in wind velocity and direction at different heights. p. 44-52c.
- Indian meteorological department. Memoirs.* Calcutta. v. 22. pt. 4. 1920.
 Field, J. H. On winds at ground-level and above, at nine stations in India. p. 505-534.
- Meteorologia pratica.* Montecassino, anno 2, Gen.-Feb., 1921.
 Crestani, G. Come si può determinare l'altezza delle nubi. p. 15-21.
- Eredia, Filippo. La navigazione aerea attraverso l'Atlantico, e la meteorologia. p. 9-14.
- Paoloni, D. B. Perghè gli animali presagiscono il tempo e i terremoti. p. 21-25.
- Preiti, Luigi. La patologia umana nei rapporti delle influenze meteorologiche. p. 2-9.
- Meteorologische Zeitschrift.* Braunschweig. Bd. 38. Apr., 1921.
 Hann, J. Die Energie der Zyklonen. p. 115-116.
 Heldke, P. Das meteorologische Beobachtungsnetz in den deutschen Kolonien. p. 101-106.
 Köppen, W. Zur Paläoklimatologie. p. 97-101.
 Quervain, A. de. Ein Fall von Schallausbreitung mit einander gegenüberliegenden Zonen abnormer Hörbarkeit. p. 118-119.
 Topolansky, Moriz. Der Sonnenschein im alten Österreich. p. 116-118.

- Nature. London. v. 107, 1921.*
 Cave, C. J. P. Cloud forms. p. 365-366. (May 19.) [Review of work by Clarke.]
 Davison, C. Chinese earthquake of December 16, 1920. p. 473-474. (June 9.)
 Mallock, A. Atmospheric refraction. p. 456-457. (June 9.)
- Nature. Paris. 49 année. 1921.*
 Villers, R. Vers les confins de l'atmosphère. La fusée Goddard. p. 310-313. (14 mai.)
 Forbin, V. Les aurores boréales. p. 344-348. (28 mai.)
 M., R. Le tube taré "Moleski" pour le gonflement des ballons de sondages aéronautiques. p. 363-364. (4. juin.)
 Idrac, M. Le vol à voile. p. 379-380. (11. juin.) [Repr. from Comptes rendus.]
- Popular astronomy. Northfield, Minn. v. 29. May, 1921.*
 Fisher, Willard J. Low sun phenomena. no. 4. The "green flash." p. 251-265.
- Wylie, Charles Clayton. Note on the effect of the barometric gradient on meridian circle observations. p. 279-280.
- Revue générale des sciences. Paris. 32 année. 15. mai, 1921.*
 Grouiller, H. Les services météorologiques aux Etats-Unis. p. 257-258.
- Scientific American. New York. v. 124. June 18, 1921.*
 Colorado's cloud-burst. Some of the causes and results of the Pueblo flood. p. 494:500.
- Società meteorologica italiana. Bollettino bimestrale. Torino. v. 40. Apr.-Giug., 1921.
 A proposito dell'aurora boreale del 22 marzo 1920. p. 32-33.
 Gamba, Pericle. Le osservazioni della nebbia ed il "neflemetro Gamba." p. 29-30.
 Gorczynski, Ladislao. Sur les dépressions observées dans les valeurs de l'intensité du rayonnement solaire. p. 25-28.
 Owens, J. S. L'atmosfera di Londra. p. 31-32. [Transl. from Country life.]
 Valbusa, Ubaldo. Replica sull'aurora boreale del 22 marzo 1920. p. 34-36.
 Vercelli, Francesco. Sulla previsione del tempo. p. 17-24.
 Wetter. Berlin. 38. Jahrg. März-Apr., 1921.
 Grabowski, L. Ueber die Berechnung der Normal-Tagesmittel zur Darstellung des jährlichen Verlaufs eines meteorologischen Elements aus vieljährigen Beobachtungsreihen. p. 52-56.
 Kleinschmidt, E. Der Einfluss des Bodensees auf die Lufttemperatur seiner Umgebung. p. 33-41.
 Prochnow, Oskar. Ein Beitrag zur Kenntnis der Wasserhosen. p. 62-64.
 Schreiber, Paul. Ueber die Ausnutzung der Windkraft für technische Zwecke. p. 46-51.
 Ständer, F. Niedrige August-Temperaturen und nachfolgende Jahreszeiten. p. 56-58.
 Wachter, H. Die Funkentelegraphie im Wetterdienst. p. 58-59.
 Wussow, G. Darstellung der örtlichen Verteilung grosser Tagesmengen des Niederschlags durch Isanomalen. p. 41-46.

551.590, 2

SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING APRIL, 1921.

By HERBERT H. KIMBALL, Meteorologist.

(Solar Radiation Investigations Section, Washington, June 30, 1921.)

For a description of instruments and exposures, and an account of the methods of obtaining and reducing the measurements, the reader is referred to this REVIEW for April, 1920, 48:225.

From Table 1 it is seen that solar radiation intensities averaged slightly above the normal at all the stations. At Santa Fe, maximum noon intensities of 1.60 gr. cal. per min. per sq. cm. measured on the 19th and 25th are very close to the previous high record for May of 1.61.

Table 2 shows a deficiency for the month in the total radiation received from the sun and sky at Washington, close to the normal amount for May at Madison, and a slight excess at Lincoln.

Skylight polarization measurements obtained on nine days at Washington give a mean of 56 per cent, and a maximum of 63 per cent on the 9th. Measurements obtained at Madison on 5 days give a mean of 66 per cent, and a maximum of 70 per cent on the 4th. These are slightly above the average values for May at both stations.

TABLE 1.—Solar radiation intensities during May, 1921.

(Gram-calories per minute per square centimeter of normal surface.)

WASHINGTON, D. C.

Date.	Sun's zenith distance.												
	8 a.m.	78.7°		75.7°		70.7°		60.0°		0.0°			
		75th me-ridian time.	A. M.	P. M.	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0
May 2	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	6.50	0.75
3	6.76	0.75	0.88	1.02	1.20	1.40	1.60	1.80	2.00	2.20	1.21	1.49	1.56
4	6.78				1.16	1.45	1.74	2.03	2.32	2.61	1.31	1.59	1.78
5	6.27				0.82	1.11	1.44	1.80	2.03	2.32	1.21	1.41	1.45
6	6.50				1.04	1.33	1.66	2.03	2.32	2.61	1.34	1.63	1.70
7	7.57	0.63	0.74	0.85	1.04	1.23	1.35	1.63	1.92	2.21	1.38	1.67	1.74
14	13.13												
17	4.95	0.66	0.77	0.93	1.13	1.42	1.07	0.86	0.75	0.65	5.16	8.48	9.53
18	8.48	0.53	0.63	0.78	0.98	1.22	1.35	1.03	0.87	0.75	7.57	13.13	13.13
20	9.83				0.51	0.88	1.08	1.35	1.03	0.87	0.75	13.13	13.13
31	13.13				0.85	1.08	1.35	1.03	0.87	0.75	0.65	13.13	13.13
Means.....		0.64	0.71	0.88	1.07	1.36	0.98	0.72	(0.75)	0.65	0.65	0.65	0.65
Departures.....	+0.03	-0.01	+0.06	+0.08	+0.07	-0.01	-0.05	+0.04

* Extrapolated.

MADISON, WIS.

(Gram-calories per minute per square centimeter of normal surface.)

Date.	Sun's zenith distance.										Local mean solar time.	
	75th me-ridian time.	Air mass.										
		A. M.				P. M.						
e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.		
May 4	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	6.76	
5	5.16					1.24	1.45				7.29	
6	6.27					1.21	1.41				7.04	
7	6.50						1.34				6.27	
8	6.27					1.21	1.38				5.38	
Means.....					0.91							
Departures.....						(0.91)	1.22	1.40				

LINCOLN, NEBR.

May 2	4.75										3.99
3	4.57										5.02
4	4.95										5.36
5	6.02										7.04
6	6.50										6.76
12	9.33										9.14
13	5.56										6.02
14	3.99										6.02
20	13.13										14.10
26	13.61										10.59
28	11.38										13.13
Means.....					0.83	0.98	1.15	1.49	1.17	(0.97)	(0.95)
Departures.....					+0.01	+0.02	+0.01	+0.11	+0.10	+0.08	+0.14

SANTA FE, N. MEX.

May 3	4.17										2.36
5	3.15	1.03									1.78
12	3.45										2.62
18	4.37										3.81
19	4.57										2.16
20	3.00										3.15
24	7.04										5.79
25	3.03										2.49
27	4.57										3.45
28	3.63										2.36
Means.....		(1.03)									
Departures.....		+0.02	+0.02	+0.03	+0.05	+0.04	+0.09	+0.01	-0.05		